

### **REMARKS**

Applicant respectfully requests reconsideration of this application in view of the foregoing amendment and following remarks.

#### **Status of the Claims**

Claims 34-37 are pending in this application, among them claim 34 is independent. All of the pending claims stand rejected. By this amendment, claims 34 and 35 are amended. No new matter has been added by this amendment.

#### **Rejections under 35 U.S.C. §103**

In paragraph three (3) of the Final Office Action, claim 34 has been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 5,120,394 to Mukai (“Mukai”).

In paragraph four (4) of the Final Office Action, claims 34-37 have been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over “Kamiya (U.S. Pat. 4,989,031) in view of Mukai (U.S. Pat. 4,989,031).” [sic]. Applicant assumes that the number of Mukai should actually be U.S. Patent No. 5,120,394 rather than U.S. Patent No. 4,989,031.

In paragraph five (5) of the Final Office Action, claims 34-37 have been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Kamiya in view of U.S. Patent No. 6,277,767 to Shiramizu et al. (“Shiramizu”).

In paragraph six (6) of the Final Office Action, claims 34-37 have been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 6,571,057 to Aoki (“Aoki”) in view of U.S. Patent No. 5,430,303 to Matsumoto et al. (“Matsumoto”).

Claims 34 and 35 have been amended for further clarification. In particular, amended claim 34 is directed to a rinsing method and recites, *inter alia*, “a second step for introducing an

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oxygen gas or an ozone gas into the second container; ... a fourth step for introducing a nitrogen gas into the second container and exhausting the oxygen gas or ozone gas in the second container, to exchange an ambience of the second container.”

One of the aspects of the present invention as featured in claim 34 as amended is a cleaning process without affecting the substrate itself, i.e., the rinsing method of the present invention gives a treatment effect that removes any organic substances adhered to the substrate surface.

The present invention is based on the finding that, after an article is rinsed by oxygen or ozone, a contaminant such as organic substance may be produced and adhered to the article. According to the method of the present invention, after the rinsing based on irradiation with ultraviolet rays in an oxygen or ozone ambience, the oxygen or ozone is exhausted and, on the other hand, nitrogen is supplied into the inner container to replace the ambience of the inner container with nitrogen. With this procedure, the non-bonds (e.g., dangling bonds) on the surface of the article tend to absorb nitrogen, and, as a result, this avoids adhesion of organic substances to the article surface. Therefore, in accordance with the present invention, re-contamination of the article is well avoided even if oxygen or ozone is used for the rinsing.

Mukai discloses that an article is placed on an inner container, a rinsing gas ( $\text{Si}_2\text{F}_6$ ,  $\text{SiH}_6$ ,  $\text{N}_2$ ) is supplied into the inner container, a light source for providing ultraviolet rays is disposed outside the inner container, and the article placed in the inner container is rinsed by irradiation with the ultraviolet rays.

First of all, Mukai does not at all teach or suggest the rinsing method of the present invention as discussed above where adhesion of organic substances to the article surface is avoided. Mukai uses a hydride gas, a fluorine gas and a nitride gas for the gas to be supplied into

the inner container. However, Mukai does not use oxygen or ozone for the rinsing. Rather, Mukai teaches a rinsing method without using oxygen. This indicates that Mukai's rinsing method has nothing to do with the adhesion problem of the organic substances that occurs when oxygen or ozone is used for the rinsing. Moreover, it should be noted that the cleaning process of Mukai is a treatment for actually etching an oxidized layer of the substrate surface, i.e., Mukai's process actually removes the surface layer of the substrate.

Applicant notes that while Mukai mentions nitride gas, the nitride gas in Mukai is supplied before ultraviolet rays are projected to the article. This means that Mukai does not teach exchanging the ambience of the inner container after the ultraviolet-ray projection, by exhausting oxygen or ozone and supplying nitrogen as specifically recited in amended claim 34.

Applicant further notes that other cited references (i.e., Kamiya, Shiramizu, Aoki and Matsumoto) also fail to show or suggest the inventive aspect of claim 34 as discussed above. For example, Kamiya merely discloses that a second container (II) is disposed inside a first container (I), a wafer is placed in the second container (II), a light source for providing ultraviolet rays is disposed outside the second container (II), the wafer placed in the second container is irradiated with ultraviolet rays and rinsed thereby, a bore is formed between the first and second containers (I and II) and the inside pressure of the first container (I) is made higher than the second container (II).

Aoki merely discloses that a first container 10 in which a light source 20 for providing ultraviolet rays is placed, a second container 21 in which a workpiece W is placed and rinsed by the ultraviolet rays, supply means 55 for supplying a rinsing gas of oxygen into the second container, and exhausting means 56 for exhausting the gas supplied into the second container.

Applicant notes that, similarly to Mukai, these cited references including Shiramizu and

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Matsumoto do not at all teach or suggest the inventive feature of the present invention that, after the rinsing, the oxygen or ozone is exhausted and nitrogen is supplied to exchange the ambience of the inner container thereby preventing and/or removing the organic substances on the substrate surface. Furthermore, these cited references are completely silent on the function of the non-bonds (dangling bonds) that absorb nitrogen on the surface of an optical element thereby avoiding adhesion of organic substance onto the article surface.

Accordingly, amended claim 34 is believed patentable over the cited references (i.e., Mukai, Kamiya, Shiramizu, Aoki and Matsumoto), either taken alone or in combination, for at least the reasons discussed above.

Reconsideration and withdrawal of the rejection of claim 34 under 35 U.S.C. §103(a) is respectfully requested.

Applicant has not individually addressed the rejections of the dependent claims (i.e., claims 35-37) because Applicant submits that the independent claims from which they respectively depend are in condition for allowance as set forth above. Applicant however reserves the right to address such rejections of the dependent claims should such be necessary.

Applicant believes that the application as amended is in condition for allowance and such action is respectfully requested.

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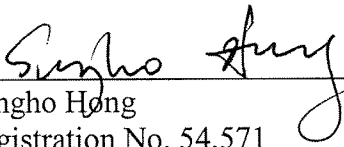
**AUTHORIZATION**

No petitions or additional fees are believed due for this amendment and/or any accompanying submissions. However, to the extent that any additional fees and/or petition is required, including a petition for extension of time, Applicant hereby petitions the Commissioner to grant such petition, and hereby authorizes the Commissioner to charge any additional fees, including any fees which may be required for such petition, or credit any overpayment to Deposit Account No. 13-4500 (Order No. 1232-4819). A DUPLICATE COPY OF THIS SHEET IS ENCLOSED.

An early and favorable examination on the merits is respectfully requested.

Respectfully submitted,  
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**AUTHORIZATION**

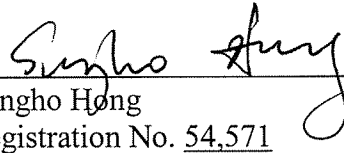
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